

## Sample Student-Completed Experimental Design Table

**Hypothesis draft:** If seed size is related to strength of the seedling, then larger seeds will break through stronger surfaces more consistently and with less damage to the seedling.

<p>Independent Variable</p> <p>varying solid surfaces for seedlings to grow through</p>	<p>Background Questions</p> <p>Determine which species of seeds will be used for "large" and "small" and how can I measure the size of the seed?</p> <p>What type of seed has a fast germination rate and is easy to grow in controlled conditions?</p> <p>What are the best solid surfaces to represent different levels of solid surfaces? (plaster of paris, concrete mix, spackling paste?)</p> <p>What other variables might be introduced by using these materials? How can I reduce those?</p> <p>What are the best ways to measure "strength" of seedlings? (crack of surfaces, speed at which they get through the surface?)</p>			
<p>Dependant Variable</p> <p><u>Quantitative</u></p> <p># of days it takes to break through surface</p> <p>width/length of the crack</p> <p>Thickness of seedling stem</p> <p><u>Qualitative</u></p> <p>Condition of the seedling during &amp; after breaking through surfaces</p> <p>condition of roots and seedling</p>	<p>Constants</p> <ul style="list-style-type: none"> <li>Seedlings all have the same lighting, watering and feeding schedule (Plants are rotated weekly)</li> <li>Data collection is done at the same time every day</li> <li>Temperature of the room remains the same for all seedlings</li> <li>Seeds of the same kind were bought at the same time and from the same package</li> <li>Seeds are all planted in the same type and size container (clear plastic cup)</li> <li>All seeds have the same quality and amount of soil underneath the solid surface</li> <li>Depth of solid surfaces are equal among experimental groups</li> </ul>			
<p><b>Experimental Groups &amp; Control Group</b></p>	<p><b>Control Group</b></p> <p>No solid surface (just soil)</p>	<p><b>Exp. Group #1:</b></p> <p>Spackling paste</p> <p>.5 cm, 1 cm, 1.5 cm</p>	<p><b>Exp. Group #2</b></p> <p>Plaster of paris</p> <p>.5 cm, 1 cm, 1.5 cm</p>	<p><b>Exp. Group #3</b></p> <p>Concrete mix</p> <p>.5 cm, 1 cm, 1.5 cm</p>